

LISTING OF CLAIMS

1(currently amended). A method for treating a substrate having an electrically conductive surface comprising:

preparing a medium having a basic pH and comprising water and at least one member selected from the group consisting of water soluble stannates, molybdates, vanadates and cerium compounds,

contacting at least a portion of the surface with the medium, [[and;]]

removing the surface from the medium ~~and then drying at a temperature of at least about 120C;~~

and; rinsing the surface; wherein the method [[is]] and the substrate are substantially free of chromates.

2(previously presented). The method of Claim 1 wherein the medium is heated to a temperature of about 50 to about 100C prior to said contacting.

3(previously presented). The method of Claim 1 wherein said medium further comprises colloidal silica.

4(original). The method of Claim 1 wherein the surface comprises at least one member selected from the group consisting of copper, nickel, tin, iron, zinc, aluminum, magnesium, stainless steel and steel and alloys thereof.

5(previously presented). The method of Claim 1 wherein said method further comprises rinsing in an aqueous medium and a second drying.

6(previously presented). The method of Claim 5 further comprising applying at least one coating upon the last dried surface.

7(previously presented). The method of Claim 1 further comprising, after said drying, applying an adherent composition comprising at least one member chosen from the group consisting of latex, silanes, epoxies, silicone, amines, alkyds, urethanes and acrylics.

8(previously presented). The method of Claim 1 wherein said medium comprises water, sodium hydroxide and sodium stannate.

9(previously presented). The method of Claim 1 wherein said medium comprises water, sodium hydroxide and sodium molybdate.

10(previously presented). The method of Claim 1 wherein said compounds comprise at least one member selected from the group consisting of sodium stannate hydrate, sodium molybdate hydrate, ammonium metavanadate and cerium nitrate hydrate.

11(previously presented). The method of Claim 1 wherein the substrate comprises at least one member selected from the group consisting of iron, iron alloys, zinc and zinc alloys.

12(previously presented). The method of Claim 1 wherein the medium further comprises at least one member selected from the group consisting of water dispersible polymers, at least one diluent, and at least one dopant.

13(previously presented). The method of Claim 1 wherein the amount of water soluble compounds ranges from about 3 to about 15 wt.% of the medium.

14(previously presented). The method of Claim 1 further comprising supplying a current to the medium and wherein the substrate comprises the cathode.

15(previously presented). The method of Claim 1 further comprising at least one additional step selected from the group consisting of contacting the metal surface with at least one acid, drying the metal surface at a temperature, and rinsing the metal surface.

16(previously presented). The method of Claim 1 wherein the medium comprises water, sodium hydroxide and cerium nitrate.

17(previously presented). The method of Claim 1 wherein the medium comprises water, sodium hydroxide and ammonium metavanadate.

18(previously presented). The method of Claim 1 further comprising treating the surface prior to said contacting with at least one process selected from the group consisting of contacting with an acidic medium, a basic medium, an oxidizing medium, and anodizing the substrate.

19(previously presented). The method of Claim 1 wherein the medium comprises an electroless environment.

20(currently amended). A method for treating a substrate comprising:
preparing a medium having a basic pH and comprising water and at least one member selected from the group consisting of water soluble stannates, molybdates, [[vanadates]] and cerium compounds,
contacting at least a portion of the surface with the medium, and;
supplying a current to the medium and wherein the [[metal]] surface comprises the cathode.

21(currently amended). A method for treating a substrate having an electrically conductive surface comprising:

providing a substrate comprising at least one member selected from the group consisting of iron, tin, aluminum, zinc and combinations thereof,
preparing a medium having a basic pH and comprising [[comprises]] water, sodium hydroxide and ammonium metavanadate, [[and;]]
contacting at least a portion of the surface with the medium, and;
rinsing the substrate; wherein the method and the substrate are substantially free of chromates.

22(new). The method of Claim 1 further comprising drying the surface at a temperature of about 120 to about 200C.

23(new). The method of Claim 1 wherein the medium comprises sodium stannate and the surface comprises at least one member selected from the group consisting of iron, tin, zinc, aluminum and combinations thereof.

24(new). The method of Claim 1 wherein the medium comprises sodium molybdate and the surface comprises at least one member selected from the group consisting of iron, tin, zinc, aluminum and combinations thereof.

25(new). The method of Claim 1 wherein the medium comprises cerium nitrate and the surface comprises at least one member selected from the group consisting of iron, tin, zinc, aluminum and combinations thereof.